



UMES SUMMER TRANSPORTATION

INSTITUTE (UMES STI)

2017 ANNUAL REPORT

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PART I: PROGRAM INFORMATION

*The Summer Transportation Institute (STI) Project Director is responsible for preparing and submitting an annual report to their State Transportation Agency and Federal Highway Administration (FHWA) Division Office. This report is due to FHWA Headquarters Civil Rights Office on or before **October 15 of each year**. The report includes the results of activities associated with the STI. One (1) electronic copy in MS Word, Font Size Times New Roman 11.5 - 12 pt is sent to each agency via electronic mail. The following components are included in the report.*

SECTION I: PROGRAM ADMINISTRATION

Host Site Name and Address

University of Maryland Eastern Shore
Department of Technology
11931 Art Shell Plaza
Princess Anne, Maryland 21853

Program Director

Dr. Joseph O. Arumala

Length of Program

The UMES STI program is a 3-week non-residential program

Type of Program

Non-Residential

Grade Levels

Levels 6-8

Number of Student Applications Received

Number of applications received was 28

Number of Students Selected for Program

Number selected was 22

Number of Students to Complete Program

Number that completed the program was 22

ABSTRACT

The purpose of the UMES Summer Transportation Institute is to create awareness and stimulate interest among middle school students on the Lower Eastern Shore of Maryland about the vast transportation careers available and provide them with the opportunities to explore the exciting

field of the Transportation Industry. The students went through a course of studies in Mathematics, Science, English and transportation systems and participated in regularly scheduled trips to local transportation related facilities. The Institute was for two weeks from June 19 to July 7, 2017. Each participant was provided lunch for the period and a Casio FX 9860 G II Scientific Calculator. Most students made transportation arrangements to and from UMES. However, seven students were picked from a central location in Salisbury, MD to attend the Institute daily because of their inability to secure transportation for the period. The program went from 8.00 am to 5.00 pm daily.

COMMITTEE, PARTNERS AND STAFF INFORMATION

1. Intermodal Advisory Committee (IAC): *Provide the names, titles and affiliations of members of the advisory committee.*

They are:

- A. Gregory Murrill
Program Manager
Federal Highway Administration
Office of Human Resources
Student Outreach and Career Entry Programs Group

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Maryland Department of Transportation
Maryland Aviation administration

- C. Dr. Joseph D. Dodo
Department of Natural Sciences
University of Maryland Eastern Shore
410 651-6030

2. Partners/Sponsors: *Provide names, titles and affiliations of STI partners/sponsors (**other than IAC members** and their role/contribution(s) to the STI.*

Bill Robinson
Director - Office of Public Relations
2102 Bird Hall
University of Maryland Eastern Shore
Princess Anne, MD 21853
410 621-2355 - office
443 397-8860 – cell

Mr. Robinson assisted in disseminating news and information about the STI in the University and local community.

Jocelyn C. Koller
4-H STEM Agent Associate
University of Maryland Extension 1890 Program
Somerset, Wicomico, and Worcester Counties
jckoller@umd.edu

Ms. Koller helped to conduct the “**Wonders of Watersheds WOW**” activity with STI participants.

- a. **Program Faculty and Staff:** *Provide the names, STI position titles, and affiliations of **all** STI faculty and staff.*

Dr. Joseph O. Arumala, Project Director
Professor
Department of Technology
University of Maryland Eastern Shore

Ardealia Ross
Science Teacher
Wicomico Middle School

Karen M. Carroll
English Teacher
Salisbury Middle School
627 Terrapin Lane
Salisbury, Maryland 21804
(410) 677-5143

Megan Bowen
Mathematics Teacher
Salisbury Middle School

Dustin M. Thomas
Prince Street Elementary
Recreation Teacher

PROGRAM OBJECTIVES

Provide a list of the STI objectives and explain the method used to measure whether or not the *objectives were accomplished. (The method of measuring accomplishments should be based on weekly evaluations submitted by participants). If objectives were not met, then an explanation of the barriers that prevented accomplishment should be provided.*

Students participating in the program will perform hands-on and practical activities, field trips, and participate in other activities that will expose them to careers, academic programs, and personnel in the transportation industry. Each student will:

- Explore safety, innovative trends, and career opportunities that exist in transportation systems;
- Become knowledgeable of the federal, state, and local governing agencies of the transportation modes;
- Develop understanding of importance of positive attitudes about learning math and science and the opportunities for advance studies;
- Exposure to college campus and opportunity to meet faculty members and college students that are involved in academic programs that lead to transportation careers;
- Development of computer, professional, and communication skills needed for successful study.

The Institute was designed to:

- Impact middle school students
- Improve oral and written communication skills
- Improve critical thinking
- Introduce intermodal transportation systems
- Encourage collaboration by working in teams on projects

The participants used prepared Questionnaires to evaluate the effectiveness of the Institute's activities weekly. The overall outcome of the evaluations was that these objectives were met.

STUDENT SELECTION PROCESS

Briefly describe the methods used and results for recruiting and selecting students.

We used a combination of visitation to schools, personal contacts and emails to recruit students for the Institute. Institute participants were selected by the Director and Dr. Joseph D. Dodoo. In the selection activity several factors were used including a written essay, Grade Point Average (GPA) and current marking term results for selecting participants. The committee received 28 applications and selected 22 applicants who met the criteria for selection and were available for the duration of the Institute. All 22 students selected participated in all activities of the Institute.

MARKETING

Summarize the strategies used to market the STI.

The strategies used to market the STI included:

- Visitation to schools, youth groups and churches
- Newspaper & Newsletter publications
- Via emails and letters
- Word of Mouth
- Town Hall Meetings
- Flyers
- In addition, a webpage was used. The application was made available on the STI web page www.umes.edu/UMESSTI

DEMOGRAPHIC SUMMARY REPORT

Complete the attached demographic summary sheet.

FY 2016	
National Summer Transportation Institute Program - Demographics Data Sheet	

State:	Maryland	Project Director:	Dr. Joseph O. Arumala
Host Site:	University of Maryland Eastern Shore	Program Dates:	June 19-July 7, 2017
		Program Length:	3-Weeks

Select Grade Level		Applicant Data	
High School		Number of Applications Received:	28
Middle School	X	Number of Participants Selected:	22
Select Program Classification		Number of Participants that Completed the Program:	22
Residential		Geographic Representation	
Non-Residential	X	Number of Cities: 5	Number of Counties: 3 Congressional District Number(s): 1

	Race/Ethnicity							Gender		Disability	Grade Level				
	African American	Caucasian	Hispanic American	Native American	Asian American	Pacific Islander	Other	Male	Female	Targeted Disabilities*	6	7	8		
Number Of Participants:	19	1			2			10	12		X	X	X		
Provide Type(s) of *Targeted Disabilities:															

Schools Represented	
Name/City/State	Name/City/State
Bennett Middle School, Salisbury, MD	Washington Middle/High School, Princess Anne, MD
Mardela Middle and High School, Mardela Springs, MD	
Salisbury Middle School, Salisbury, MD	
Somerset Intermediate School, Princess Anne, MD	
Wicomico Middle School, Salisbury, MD	
Snow Hill Middle, School, Snow Hill, MD	
* Targeted Disabilities Includes the following: Deafness, Blindness, Missing Extremities, Partial/Complete Paralysis, Convulsive Disorders, Mental Retardation, Mental Illness, And Distortion Of Limbs And/or Spine. Reference Secretary Mary E. Peters, Memorandum Dated 4/2/07 To Departmental Officers, Assistant Secretaries, And Heads Of Operating Administrations; Subject: Fiscal Year 2007 Hiring Goals For Persons With Targeted Disabilities, Washington, DC.	

SECTION II: PROGRAM CURRICULUM

ACADEMIC PROGRAM

Describe the multi-modal academic program. Information on field trips and speakers should be included. Highlight significant accomplishments and innovations. An academic program calendar is also necessary.

The academic program consisted of written communication and critical thinking components interweaved with transportation activities and studies, English, Mathematics and Science sessions. The English, Mathematics and Science studies were geared towards preparation of the students for taking standardized tests. The lesson plans for each module are shown below:

ENGLISH/COMMUNICATION

Karen Carroll - Instructor

Title of Unit- Communication in STEM/Transportation

Objectives

Reading Informational Text-

Determine what is factual, reasoned judgement supported by research

Use information expressed in visual formats
(graphs, flowcharts, tables) to draw conclusions about the meaning of
an issue

Complete a multistep process with precision to perform a technical
task

Express what the scientific or technical text says, citing evidence from
the text that supports your analysis.

Speaking and listening-

Design and deliver presentations that incorporate multimedia
components and visual displays associated with mathematical and
scientific information

Writing-

Write for a range of reasons-reflection, research, revision in various
contexts and modes

Write with clarity, developing and organizing ideas to develop a style
that is appropriate to purpose and audience

Generate and gather ideas about the topic, making a plan for how to

write about and use ideas, drafting, organizing and evaluating as they create and complete the purpose of the presentation

MATHEMATICS

Megan Bowen– Instructor

MATH IS FUN!

The goals for the three weeks were teaching the students the following:

1. Teach them how mathematics connects to transportation, ex. The rates in which things travel and graphing those rates.
2. Have the students use their graphing calculators and build an understanding of the basic uses for their graphing calculator.
3. Have them complete STEM challenges that had them cooperatively working with each other.

I chose to focus on these goals because I thought they were the most important to the program. To reach these goal I taught the following lessons.

Date	Lesson	How does it connect?
6/19	Lesson 1: Students were completing get to know you activities together. Many of the teachers participated as well.	This was used to help the students build relationships within the camp.
6/20	Lesson 2: Students created a picture that describe how they learn mathematics. They also completed a pre-assessment.	The purpose of this less was to continue building the students relationships with each other and myself. Then I wanted to know what they already knew about the topics we were going to cover. The pre-assessment gave me this knowledge.
6/21	Lesson 3: Students shared what they knew about graphs and then were able to survey everyone and create their own graph that represented the class. Finally, we began an activity in which students created their own paper airplane and found the average distance that it traveled and then graphed this.	I wanted to know what they already knew about graphs. Having them create their own accomplished this. I also wanted to then take the knowledge that they already had and put it to

		the test in the airplane activity.
6/22	FIELD TRIP	FIELD TRIP
6/23	Lesson 4: Students were given time to finish their airplane activities and they then created an equation to represent how their plane traveled. After they were done the student completed a Gizmo about runners in a race. This asked them to answer questions about a graph and what points on the graph meant.	Students were about to create a graph about their airplanes and decide which airplane traveled the fastest. Then by looking at graphs that were not traveling at a constant rate the students gained an understanding of what different slopes indicated.
6/26	Lesson 5: Students began to working with their graphing calculator. They began with a graphing calculator scavenger hunt. Students began this as a whole class and then were put into small groups to complete the rest of it. At the end of class we reviewed some of the functions that were harder for the students to complete.	This lesson was used to give the students a basic understanding of the graphing calculator and its functions.
6/27	Lesson 6: Students completed a graphing tic tac toe activity. They were able to pick four prompts that were on a tic tac toe board. Once they had written the steps for each prompt they had to create a poster about how to complete the tasks and then present these steps to the class.	This was to help the students build their understanding of the graphing calculators and help other students better understand the calculators.
6/28	Lesson 7: Students completed graphing calculator and general mathematics task cards that were posted around the room. These cards include questions about interpreting graphs and also the graphing calculator tasks that we had learned about. As an exit ticket students were asked to create a story to represent a graph.	This had the students focusing on the graphing calculator as well as the mathematics that we had covered the week before.
6/29	FIELD TRIP	FIELD TRIP
6/30	Lesson 8: Students began working on Paper Roller Coasters. They had to first learn the basics of that they needed in order to make the paper roller coasters and then they had to complete their plan and request for materials.	This was the beginning of a STEM project that connected to science and mathematics.
7/3	Lesson 9: Students were given time to begin	This is when the students

	building their roller coasters. As a whole class we built the supports for the roller coasters and then began to add the aspects that made them different, ex. Funnels, loops, etc.	began to engineer their roller coaster and answer the mathematics questions about the roller coaster that they were creating.
7/4	HOILDAY CLOSED	HOLIDAY CLOSED
7/5	Lesson 10: Students were given the whole class time to work on their roller coaster and then test their roller coaster if they finished early. Many students tested their roller coaster and when then did not like the outcome went back and changed it again.	Students were able to test their roller coaster and see if they would function or not. If they did not they had to go back and alter something about the roller coaster to make it work.
7/6	FIELD TRIP	FIELD TRIP
7/7	<p>Lesson 11: Students were given time to finish their roller coaster and to complete their conclusion. This asked them to answer the following questions:</p> <ul style="list-style-type: none"> • Did your roller coaster work? If it did what do you think cause this to happen? If it did not what do you think caused that to happen? • How do the roller coasters relate to transportation? • If you were to do this activity next year what would you change about it? <p>Students were also given time to complete their post assessment.</p>	This allowed the students to complete their project and then reflect on what they completed and connect it to our theme of transportation. This also allowed me to asses if the students learned about the mathematics that I taught them.

Through these lessons my hope is that the students built an understanding of mathematics and the fact the math does connect to almost everything in life, including transportation. On the first day of the STI camp I gave my students a pre-assessment and the average score of this pre-assessment was a 58%. There were not any numbers that I would consider an outlier therefore I am using the mean to describe the students as a group. On the last day of camp I gave the students a post assessment and almost all of their post assessments showed growth. While I believe the students did learn this summer at camp, I also believe that there are some improvements that I could make to my lesson in order to help them reach these goals more easily.

SCIENCE
Ardealia Ross – Instructor

UMES: Summer Transportation Institute Science Lesson Overview

TIME	General Plans
Week 1	Transportation-related Science Concepts <ul style="list-style-type: none"> • Pre-test • Students Grouped according to their transportation-related occupation interest (land, air, sea) • Explore transportation-related science terms: motion, friction, Newton's Laws, etc. • Relate terms to specific forms of transportation (land, air and sea) • HANDS ON: Simple airplane, car and boat model building
Week 2	<div style="display: flex; justify-content: space-between;"> <div> Transportation Improvement Plans <ul style="list-style-type: none"> • Explore <i>specific</i> Transportation-related careers (land, air and sea) • <u>ENG</u>: Research/explore historical transportation improvements • <u>MATH</u>: Calculations in efficiency based on improvements • SCIENCE: Student-developed transportation improvement plans • Improvement plans include at least 2 science-related terms • HANDS ON: Moderately complex transportation-related improvement models </div> <div> Careers/Transportation </div> </div>
Week 3	<div style="display: flex; justify-content: space-between;"> <div> Model Preparation <ul style="list-style-type: none"> • Post-test • HANDS ON: Develop and test complex transportation related models • Incorporate hypothetical transportation improvement plans in presentation of completed models </div> <div> Building/Testing/Presentation </div> </div>

UMES: Summer Transportation Institute

Science: Key Terms

Science: Transportation Engineers

This module will cover the fundamentals of transportation-related mechanics including:

TOPIC/DEFINITION	DAYS	ONLINE RESOURCES
<u>Motion</u> the changing of location or position		Flocabulary video https://www.flocabulary.com/unit/motion/video/
<u>Force</u> is a push or pull. Force is measured in units called newtons (N)		N/A
<u>Friction vs. Motion</u> (F) occurs when two surfaces move over each other.		https://www.flocabulary.com/unit/forces-and-motion/video/
<u>Gravity and Motion</u> (G) is the force of attraction between any two bodies. It increases with increasing mass of the bodies and decreases if they are further apart. *the force that pulls all things towards the center of the earth		https://www.flocabulary.com/unit/gravity/video/
<u>Falling Objects & Air Resistance</u> Air resistance and water resistance are friction forces caused by the movement of something through the air or the water.		See Airplane Worksheet for Videos
<u>Newton's Laws of Motion</u> an English philosopher and mathematician who originated the theory of gravity <hr/> (E) is transferred by heating by; radiation, conduction and convection. The amount of energy transferred is measured in joules. (kinetic, potential, mechanical, thermal, & chemical)		http://www.physics4kids.com/files/motion_laws.html (print)

UMES: Summer Transportation Institute

SCIENCE IN ACTION: Daily Lessons

WEEK1: Transportation-related Science Concepts			
DAY	TOPIC	LESSON	MATERIALS

<p>Mon 6.19.17</p>	<ul style="list-style-type: none"> • Introductions: Student/Staff • Overview of Camp • Science In Action Overview 	<ul style="list-style-type: none"> • Set the stage (phones, behavior expectations, etc.) • Review Course Outline <p><u>Week 1:</u> HEADS-ON ** Flocabulary, Kahoots, KWL</p> <p><u>Week 2:</u> HANDS-ON **Physics-related projects [paper airplanes, rockets, smart cars], iPhone transportation kits</p> <hr/> <ul style="list-style-type: none"> • Pre-test <p>Divide into groups, assign seats/computers near front of class, have group name themselves after a woman/person of color scientist who made significant contributions to transportation. <u>EXAMPLE: Elijah McCoy/McCoy's Mavericks</u></p>	<ul style="list-style-type: none"> • Pre-test • Research Group Selection Worksheet
<p>Tues 6.20.17</p>	<ul style="list-style-type: none"> • Overview of all Key Terms related to the "physics of transportation" 	<ul style="list-style-type: none"> • Review two forms of "note-taking" • Key Terms Definition Activity (based on previous knowledge) • View Flocabulary Videos that define each term • Adjust Definitions (after viewing videos) 	<ul style="list-style-type: none"> • Key Terms Definition Worksheet
<p>Wed 6.21.17</p>	<p>Newton's Law of Motion</p>	<ul style="list-style-type: none"> • Teach: Newton's Law of Motion • Explain relation between each Law and a different form of transportation 	<ul style="list-style-type: none"> • Newton's Law's Worksheet

Thurs. 6.22.17	Maryland Air & Space Museum	FIELD TRIP ~ ALL DAY: ROSS/BADAKI ATTENDS~	
Fri 6.23.17	The Physics of Airplanes	<ul style="list-style-type: none"> • Hands-on exploration of physics terms and Newton's Law • Apply to airplanes • Make/test different types of paper airplanes • Review why some flew better than others 	<ul style="list-style-type: none"> • YouTube Paper Airplane videos
WEEK 2: Transportation Careers/Transportation Improvement Plans			
Mon 6.26.17	Experiential Learning	<ul style="list-style-type: none"> • Physics Projects: Divide into 5 groups (each do one of the experiments and share with group) • SmartCar Projects: Overview of machines; groups choose which form of transportation they will build 	<ul style="list-style-type: none"> • Physics Project Kits • SmartCar Kits
Tues 6.27.17	Baltimore & Ohio Railroad Museum	FIELD TRIP ~ ALL DAY: CARROLL/THOMAS ATTENDS~	
Wed 6.28.17	Experiential Learning	START BUILDING: SmartCar Projects	<ul style="list-style-type: none"> • SmartCar Kits • Batteries

Thurs. 6.29.17	Experiential Learning	COMPLETE/TEST: SmartCar Projects	<ul style="list-style-type: none"> • SmartCar Kits • Batteries • iPads, iPhones
Fri 6.30.17			•
WEEK 3: Model Building/Testing/Presentation Preparation			
Mon 7.3.17	Experiential Learning	<ul style="list-style-type: none"> • Physics Projects: Divide into 5 groups (each do one of the experiments and share with group) • SmartCar Projects: Overview of machines; groups choose which form of transportation they will build 	<ul style="list-style-type: none"> • Physics Project Kits • SmartCar Kits
Tues 7.4.17	CLOSED		
Wed 7.5.17			
Thurs. 7.6.17	Experiential Learning	COMPLETE/TEST: SmartCar Projects	<ul style="list-style-type: none"> • SmartCar Kits • Batteries • iPads, iPhones
Fri 7.7.17	Closing Ceremony	AM: Special Speaker before Lunch (8:00am – 11:00am) PM: Presentation for Families @ 3:30	

Summer 2017 Ideas

- Include more explicit activity/lesson related to transportation "occupations."
- Addition to Pretest: Name all the occupations/career you know related to transportation.
- Research Project: What form of transportation would you improve? Explain how you would it improve it, why it needs to be improved, explicitly how it relates to one of Newton's Laws.

Sports and Recreation Program

Dustin Thomas - Instructor

During the Summer STI camp I was in charge of the recreation activities from 3:30 to 5:00 each day. During our time together we were able to go bowling twice which was great because we could relate the spinning of the ball to physics and force. One day we were able to go to the driving range and hit golf balls off the tee box. This was great because most of the students had never used a golf club before. The kids hit the ball and then we discussed about trajectory and how the wind can affect the balls movement during flight. The other days we played games on the grassy area on the UMES campus. A camp favorite was Capture the Flag, which is 2 teams trying to accomplish taking the other teams flag while in enemy territory. This game was neat to watch because the students had to come up with a strategy and plan for the game. Another day we played a giant soccer game. Most of the kids enjoyed this as well. The remaining days we went to the basketball courts and played some small sided game such as 3-3 and a shooting game called knock-out. The students all took turns and rotated in and out of the games. The students also had a choice to jump rope, jump over hurdles and play soccer while at the course.

The only challenges I would say about the recreation activities was getting the large number of students to stay together while traveling to our destination. Also having the pool unavailable really upset some students. I thank you again for allowing me to join the STI program and look forward to next year!

Environmental Design & Stewardship

Where applicable in the projects, environmental stewardship was integrated in a way that gives the students an understanding of their role in protecting the environment. As an example, with the West Point Bridge software, while designing the bridge, the students were introduced to the requirements for maintaining the water ways over which bridges are built. This included the coverage of environmental topics such as waste management, pollution control and recycling of materials to save the earth. This theme will be integrated into other academic areas as well as discussion during and after field trips as students will be asked to suggest how the areas they had visited can be environmentally improved.

Partnership with University of Maryland Extension 4-H STEM “Wonders of Watersheds WOW” Summer Program

This year, the UMES STI partnered with the University of Maryland Extension 4-H STEM to present the “**Wonders of the Watershed WOW**” to the participants. The program was offered in the second week and it lasted about one and half hours for each day

Program Description:

The 4-H STEM Team developed and taught the “Wonders of Watersheds- WOW” summer program at the UMES STI this year. This summer program the participants about watershed concepts such as storm water runoff, water properties, water conservation, and water filtration. The program emphasized the ecological importance of watersheds, specifically the Chesapeake Bay Watershed and the Coastal Bays.

Program Objectives:

Objectives for the “WOW” summer program:

1. Youth will learn about watersheds, specifically the Chesapeake Bay Watershed.
2. Youth will participate in hands-on, experiential learning STEM activities
3. By continuing to learn STEM concepts during the summer, youth will boost their learning and avoid the “summer slide” where youth may lose some educational gains made during the course of the school year.
4. Youth will become familiar with science terms and lab skills.
5. Youth will learn how to become environmental stewards in their Chesapeake Bay Watershed communities.

New/Ongoing Project:

The 4-H STEM Summer Program is not a new program; however, the theme “Wonders of Watersheds- WOW” is a new theme for 2017. Each year, the summer program has a different theme. In 2014, the theme was “Rise to the Challenge” where activities centered on rising, examples including youth creating bread and learning how yeast causes it to rise, and how to build a skyscraper and test their build on an earthquake table. In 2015, the summer program was entitled, “You’ve Got MAEL! (Mobile Aerospace Engineering Lab),” where youth built and launched hot air balloons, rockets, and parachutes. Last year, the summer program theme was STEM₂O, where the focus was water-related STEM activities. Youth built buoys and investigated underwater remote operated vehicles (ROV) and amphibious cars. This year’s summer program theme “Wonders of Watersheds” will similarly teach STEM through engaging, hands-on activities. The 4-H STEM team has previously collaborated with all of the proposed 2017 summer camp programs.

Constituency to be served:

The 4-H STEM initiative seeks to enhance and expand 4-H STEM programs designed to meet the needs of a diverse, underserved audience in Wicomico, Worcester, and Somerset counties. The goal of the 4-H STEM program includes teaching youth STEM curricula while also developing leadership and life skills to empower youth to reach their full potential. As part of the 1890 Extension Program mission, 4-H STEM serves diverse audiences with special emphasis on those with limited resources, including underserved and minority students. For example, one of the counties that the initiative serves is Somerset County. This county has approximately a 48% minority population (http://www.mdp.state.md.us/msdc/census/cen2010/PL94-171/CNTY/Tot_Minority_share_2010.pdf), and is the most impoverished county in Maryland with 26% of the population living in poverty (<http://msa.maryland.gov/msa/mdmanual/01glance/economy/html/income.html>, <https://www.census.gov/quickfacts/table/PST045214/24039/accessible>).

Follow-up Survey of Participants

The UMES Summer Transportation Institute is designed to attract middle school students to the transportation industry. It will therefore seek to track the academic performances and interests of the alumni of the Institute by keeping relevant data as they move into high school and eventually entry into college and the workforce. Base data will be collected through the application and selection process. At the end of each summer session an exit survey will be administered on the

participants to determine whether their interest is still in the transportation industry. Thereafter, an annual survey will be sent out to alumni to find out if their interests is still in the transportation industry or other STEM related careers. To assist students in exploring scholarship and career opportunities in the transportation industry, links will be provided to local and federal sources on the Institute's webpage. When enough data has been collected, this follow-up exercise will be part of the annual report.

We plan to use Exit Survey to produce base data that will be used to create a plan to keep the STI alumni interested in the Transportation Industry. It is planned to produce a Newsletter on STI activities that will be distributed to participants. Finally, we plan to create a monitoring system to track the interest of participants in Transportation as they progress through high school to college.

ENHANCEMENT PROGRAM

Describe the enhancement program activities and highlights with objectives and accomplishments

The Enhancement Program activities addressed land, air and water transportation systems. The activities included hands-on components and field trips. The following areas were covered:

Highways – Road Construction

The students were introduced to highway and bridge construction with highlights of students performing the Standard Proctor Test which is used to control the strength of road bases and measuring elevation using the automatic level. They were shown the typical cross-section of a road with typical components of sub-grade, sub-base, base and the riding surface.

Surveying

The students used the Automatic Level and Level Rod to measure elevations. Elevations are important in highway construction. A road pavement must be built at predesigned elevation (height) above the mean sea level to insure optimum performance.

Bridges

The students used the West Point Bridge software to simulate the building of a bridge over a river. The students built and tested the bridge. When some truss members failed during the load testing, they were able to go back to the drawing board and strengthen those members that failed. A truss bridge model was assembled by the students.

Air Transportation

Instructor: **Dr. Joseph N. D. Dodoo**

Abstract

The areas in Airways and Aviation Sciences covered included: Navigation & Planning, National Airspace System, Categories of Aircraft, and Aerodynamics including aircraft components, axes

of rotation and fundamentals of flight. The students were also exposed to the Flight Simulator where the student learned to fly a plane and to Air Traffic Control activities. This module also included aspects of Air Travel Safety and careers in the air transportation industry.

The Air Transportation component of the Summer Transportation Institute began with a Safety briefing. The students were then instructed on categories of aircraft, and the National Airspace System. They learned to read the Washington Sectional chart and successfully identified various airports including the Salisbury Wicomico County Regional Airport. They learned about runway orientation and traffic pattern and pattern altitude. The students successfully planned a flight from Salisbury (KSBY) airport to Baltimore, Martin State Airport (KMTN). They were able to use a flight plotter to determine the distance between the two airports.

The students also enjoyed flying a flight simulator courtesy of Mr. John Abent who very generously donated time and equipment, a mobile flight simulator for use of the Summer Institute. Before flying the students were lectured on the fundamentals of flight. The flight was conducted in a highly professional manner. That is, it consisted of a crew of a pilot (a captain), and a co-pilot (first officer). In the interest of time each flight was limited to five minutes and also runway pattern. Once complete the crew switched places so that each students could be pilot in command. While the flight was being conducted in the mobile flight simulator, Mr. Simeon Richardson simulated an airport tower in the lab to establish communication between pilot and control tower. Students took turns in playing the role of controller.

The final part of the Air Transportation program was a day trip to the Air and Space Centre in Norfolk, Virginia. A guided tour was provided which proved to be quite educational. There was a variety of airplanes spanning several decades. The students also saw original space capsules and a wide array of space memorabilia including mock-ups of Luna and Mars surfaces.

In this section the participants were exposed to the Flight Simulator where they learnt the basics of how to fly a plane and to Air Traffic Control activities. The areas covered included:

- Topics: Airports, Aerodromes, Water Aerodromes, Define Aircraft.
- Instructional tools: PowerPoint Presentation and Internet Assignments
- Topics: Aeronautical Charts Familiarization and Introduction to Aviation Navigation.
- Instructional Tools:
 - Visit the UMES Air Traffic Control Simulator
 - PowerPoint Presentation
 - Maryland Aviation Administration Aeronautical Chart
 - Navigation Plotter
 - Flight Computer – E6B
 - Navigation logs
- Topics: The Flight Training Process and Airplane Nomenclature
- Instructional Tools
 - PowerPoint Presentation
 - Visit and Fly the UMES Flight Simulator
 - P-51 Model Airplane

Field Trips

We made field trips to the Baltimore and Ohio Railroad Museum, 901 W Pratt Street, Baltimore, Maryland 21223 on June 22, 2017 and to the Baltimore Washington International Airport on June 29, 2017, and to Cape May Ferry, Lewis, Delaware on July 6, 2017.

EVALUATIONS

Summarize the results of the overall evaluations. Participant evaluations may be included as an appendix.

The participant evaluations of the Institute's activities were generally widespread. However, the overall evaluations were good.

ORIENTATION AND CLOSING AWARDS PROGRAMS

Summarize the orientation and closing programs, including information on awards and certificates presented. Include a list of "dignitaries" and a copy of the press announcement of the Closing Awards Program, if applicable.

The 2017 Summer Transportation Institute's Opening Ceremony started at 9.00 a.m. on Monday, June 19, 2017 with opening activities which included the sharing of information about the program with parents and guardians with all program workers (Teachers and Student Assistants) in attendance. The Director welcomed the student participants and their parents/guardians and gave a brief overview of the Institute's activities. A formal introduction of students, parents/guardians, and Institute's staff and faculty followed. The schedule for the program was then distributed and the Director went over it highlighting the activities for each day of the three weeks duration of the Summer Institute. The Director answered questions about the schedule. Daily transportation was a concern for some parents. The opening ceremony lasted for one hour after which the regular activities went on as scheduled.

The Closing Ceremony was on July 7, 2017 at 3:30 p.m. The key note address was given by Mr. Felix C. Sappor, Transportation Engineering Consultant, Project Development Division, Office of Highway Development, MDOT- State Highway Administration, District 1 Office, 660 West Road, P.O. Box 2679, Salisbury, Maryland 21802. The students made presentations in five groups. Each group researched the contributions of women to transportation. Following this, the participants were presented with certificates of attendance and a package including the Casio FX 9860 G II scientific calculator. Seven Trophies were awarded to outstanding students and Teacher as follows:

TROPHY AWARDS

Seven Trophies were awarded to outstanding students and Teacher as follows:

1. Overall Best Student: Ameen Anaseri
2. Transportation: Theresa Ogbonna
3. Mathematics: Chidera Benedict
4. Science: Andrea Doane
5. Communication: Austin Mecca

6. Sports: Malachi Harrison
7. Best Teacher elected by the STI participants: Ardealia Ross

In addition to the parents, those who attended the closing ceremony included Dr. Ayodele J. Alade, Professor and Dean, School of Business and Technology, University of Maryland Eastern Shore.

Background Checks and Child Abuse Training

Prior to the starting of the 2017 UMES STI , Background checks were completed for program employees and volunteers. Also all employees including Student Assistants underwent a Child Abuse Training in compliance to state regulations.

UMES Youths Programs Audit

The UMES STI was one of the Youth Programs that was audited for its 2016 activities. Overall, the Audit Report was favorable.

SECTION III: PRELIMINARY FINANCIAL REPORT

Provide a report of the STI account activity that details reimbursement requests and expenditure of funds to date.

See enclosed Financial Report

Budget			
Categories	Approved	Expended*	Unexpended
Personnel	\$11,000.00	\$1000.00	\$10,000.00
Fringe Benefits	\$858.00	\$1,76.71	\$0.00
Recruitment	\$0.00	\$0.00	\$0.00
Contractual Services	\$20,650.00	\$20,650.00	\$0.00
Food	\$6,550.00	\$6,550.00	\$0.00
Travel	\$3,000.00	\$3,000.00	\$0.00
Supplies	\$9,249.60	\$9,249.60	\$0.00
Room & Board	\$0.00	\$0.00	\$0.00
Stipends	\$0.00	\$0.00	\$0.00
Indirect Cost	\$4,104.61	\$4,104.61	\$0.00
Totals	\$55,412.21	\$45,412.21	\$10,000.0

Balance = \$10,000.00

***SOME CATEGORIES ARE STILL BEING UPDATED**

SECTION IV: RECOMMENDATIONS

Provide any recommendations for enhancing operations and accomplishments of the STI.

It is recommended that funds be made available early enough to allow time for adequate preparations for all the activities of the Institute including hiring of staff and preparation and approval of contracts, securing on-campus facilities and procurement of supplies and materials.

PART II: APPENDIX

This section may include documentation such as photographs, journal entries, participants' papers, participants' reports, graphics, etc.

Some photographs of activities are shown below:

NOTE: More photos can be seen at www.umes.edu/UMESSTI



Figure 1 Students, Teachers & Parents at the Closing Ceremony



Figure 2 Students at Different Activities



Figure 3 Student Award and BWI Field Trip